CLAIMS

1. A wireless communication system, comprising:

a plurality of radios each having at least one antenna interface associated therewith;

a plurality of antennas;

a switch matrix that is operable to selectively couple said plurality of antennas to said antenna interfaces; and

a controller that is operable to control said switch matrix such that a limited number of said antenna interfaces are coupled to a same antenna of said plurality of antennas, wherein said controller is operable to apply a configuration, of said antenna interfaces to said plurality of antenna, that provides priority to selected ones of a plurality of channels associated with said plurality of radios based upon power and channel quality metrics of said selected ones of said plurality of channels in a first mode of operation.

2. The wireless communication system of claim 1 wherein said plurality of antennas are arranged to provide at least one item selected from the list consisting of spatial diversity, polarization diversity, and directional diversity.

3. The wireless communication system of claim 1 further comprising:

a coherent receiver that is operable to calculate a carrier-to-interference (C/I) ratio for each channel associated with said plurality of radios for each antenna of said plurality of antennas, wherein said coherent receiver is communicatively coupled to said controller and said controller is operable to utilize C/I ratios from said coherent receiver to assign selected ones of said plurality of channels to said plurality of antennas.

4. The wireless communication system of claim 1 wherein said controller is operable to calculate a power matrix with each term ($P_{i,k}$) of said power matrix being equal to

($V_k \cdot (C/I)_{k,k}/(C/I)_{i,k}$), wherein V_k is a respective forward-link power associated with a k^{th} channel, $(C/I)_{k,k}$ is a respective carrier-to-interference C/I ratio for the k^{th} channel as received on an antenna that is currently being using for the k^{th} channel, and $(C/I)_{i,k}$ is the respective C/I ratio associated with the k^{th} channel as received by the i^{th} antenna.

5. The wireless communication system of claim 1 wherein said controller is operable to determine said configuration of said antenna interfaces to said plurality of antenna by minimizing a summation of forward-link power of a plurality of channels in said first mode of operation.

6. The wireless communication system of claim 1 wherein said controller is operable to randomly assign a plurality of channels to said plurality of antennas in a second mode of operation.

7. The wireless communication system of claim 1 wherein said controller is operable to successively assign a plurality of channels to said plurality of antennas in a second mode of operation.

8. The wireless communication system of claim 1 wherein said controller operates in a second mode of operation when a fading rate of Raleigh fading of a plurality of channels is sufficiently low.

9. The wireless communication system of claim 1 wherein said controller operates in a second mode of operation when frequency hopping averaging does not allow for shadow fading estimation.

10. The wireless communication system of claim 1 further comprising:

a second switch matrix that is operable to switch reverse-link signals to said plurality of antenna interfaces under the control of said controller.

11. A method for operating a wireless communication system, comprising:

generating concurrent forward-link transmit signals for a plurality of channels;

determining a current forward-link power for each of said plurality of channels; and

assigning, in a first mode of operation, said plurality of channels to said plurality of antennas for transmission of said concurrent forward-link signals by selecting the antenna assignment that minimizes total forward-link transmit power

12. The method of claim 11 further comprising:

assigning said plurality of channels to said plurality of antennas for transmission of said concurrent forward-link signals in a second mode of operation when both of the following conditions are true: (i) fading rate of Raleigh fading of said plurality of channels is sufficiently low; and (ii) frequency hopping averaging does not allow for shadowing fading estimation.

13. The method of claim 12 wherein said plurality of channels are assigned to said plurality of antennas in a successive manner in said second mode of operation.

14. The method of claim 12 wherein said plurality of channels are assigned to said plurality of antennas in a random manner in said second mode of operation.

15. The method of claim 11 further comprising:

measuring a carrier-to-interference (C/I) ratio associated with a respective reverse link for each of said a plurality of channels on each of a plurality of antennas; and

calculating a power matrix with each term ($P_{i,k}$) of said power matrix being equal to ($V_k \cdot (C/I)_{k,k}/(C/I)_{i,k}$), wherein V_k is a respective forward-link power associated with a k^{th} channel, $(C/I)_{k,k}$ is a respective C/I ratio for the k^{th} channel as received on an antenna that is currently being using for the k^{th} channel, and $(C/I)_{i,k}$ is the respective reverse-link C/I ratio associated with the k^{th} channel as received by the i^{th} antenna.

16. The method of claim 11 wherein said assigning in said first mode of operation is operable to calculate a respective forward-link power summation for a plurality of assignment combinations of said plurality of channels to said plurality of antennas.

17. The method of claim 11 further comprising:

switching reverse-link signals from said plurality of antennas to a plurality of transceivers such that respective antennas associated with best channel quality metrics for respective channels are provided to respective transceivers.

18. A wireless communication system, comprising:

a plurality of antenna means for transmitting forward-link and receiving reverse-link signals;

transceiver means for concurrently generating forward-link signals for a plurality of channels;

switching means for switching said forward-link signals of said plurality of channels to said plurality of antenna means; and

a controller means for controlling said switching means such that each concurrent forward-link signal of said plurality of channels is switched to a different antenna means of said plurality of antennas means, wherein said controller means is operable to cause said switching means to switch a forward-link signal associated with a highest transmit power to an antenna means that is associated with a highest channel quality metric for the reverse-link signal that corresponds to said forward-link signal in a first mode of operation.

19. The wireless communication system of claim 18 wherein said plurality of antennas are arranged to provided at least one item selected from the list consisting of spatial diversity, polarization diversity, and directional diversity.

20. The wireless communication system of claim 18 further comprising:

a receiver means that is operable to calculated a carrier-to-interference (C/I) value for a reverse-link of each of said plurality of channels as received by each of said plurality of antenna means.

21. The wireless communication system of claim 18 wherein said controller means is operable to determine an assignment combination of forward-link signals of said plurality of channels to said plurality of antenna means that minimizes a summation of forward-link power of each of said plurality of channels in a first mode of operation.

22. The wireless communication system of claim 18 wherein said controller means, in a second mode of operation, is operable to assign forward-link signals to said plurality of antennas means in a manner selected from the group consisting of (i) a random manner and (ii) a successive manner.

23. A method for operating a wireless communication system, comprising:

generating concurrent forward-link transmit signals for a plurality of channels;

measuring a channel quality metric associated with a respective reverse link for each of said a plurality of channels on each of a plurality of antennas;

determining a current forward-link power for each of said plurality of channels; and

assigning, in a first mode of operation, said plurality of channels to said plurality of antennas for transmission of said forward-link signals such that (i) no more than one channel is concurrently transmitted from a respective antenna; and (ii) assignment of said plurality of channels to said plurality of antennas minimizes total forward-link transmit power.

24. The method of claim 23 further comprising assigning said plurality of channels to said plurality of antennas for said forward-link signals according to a second mode of operation when both of the following conditions are true: (i) fading rate of Raleigh fading of said plurality of channels is sufficiently low; and (ii) frequency hopping averaging does not allow for shadowing fading estimation.

25. The method of claim 24 wherein said plurality of antennas are randomly assigned to different antennas in said second mode of operation.

26. The method of claim 24 wherein said plurality of antennas are successively assigned to different antennas in said second mode of operation.

27. The method of claim 23 further comprising:

calculating a power matrix with each term ($P_{i,k}$) of said power matrix being equal to ($V_k \cdot (C/I)_{k,k} / (C/I)_{i,k}$), wherein V_k is a respective forward-link power associated with a k^{th} channel, $(C/I)_{k,k}$ is a respective carrier-to-interference (C/I) ratio for the k^{th} channel as received on an antenna that is currently being using for the k^{th} channel, and $(C/I)_{i,k}$ is the respective reverse-link C/I ratio associated with the k^{th} channel as received by the i^{th} antenna.